

# **A successive fine graining approach for predicting the rheological properties of a dilute polymer solution**

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A new computational tool to predict the rheological properties of a dilute solution of polymers is presented. Within this approach, a non-linear bead spring chain model is used with hydrodynamic interactions (HI) approximated by the Rotne-Prager-Yamakawa tensor, and excluded volume (EV) interactions modelled by a narrow-Gaussian repulsive potential. While it is known that inclusion of these effects are important to obtain accurate predictions, the present methodology presents a novel consistent framework to estimate parameters in the model. This leads to a method, to consistently represent a polymer of finite length with increasing number of microscopic modes (or equivalently beads in the chain).